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| 10/536,841 | 05/31/2005 | Andrea Giraldo | NL 021321 | 6507 |

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| MA, CALVIN | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. 10/536,841 | Applicant(s) GIRALDO ET AL. | |
|---|---|---|---|
| | Examiner CALVIN C. MA | Art Unit 2629 | |

***-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --***

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *14 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-14,16,17,19 and 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,16-17,19-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

1. The response filed in 1/24/2009 has been considered, the prior art Inukai US Pub: 2002/0047555 has been introduced to address the newly amended claims.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4, 6-14, 16-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bu (US Patent: 6,433,488) in view of Inukai. (US Pub: 2002/0047555).

As to claim 1, Bu teaches a pixel cell (i.e. one unit in the matrix of OLED array) in an active matrix display (i.e. active matrix OLED display) (see Fig. 2, Col. 3, Lines 1-23) comprising:

a current driven emissive element (OLED 1) (see Fig. 2, Col. 3, Lines 4-10),

a data input for receiving an analog data signal (i.e. the data signal 4 which is an analog signal as the voltage simulated on data is an analog quantity) (see Fig. 2, Col. 3, Lines 38),

at least two drive elements (2 and 5), each being connected to a power supply (i.e. the power supply supplies the Vs and Vpp potential) and arranged to drive the emissive element (1) in accordance with said analog data signal (4) (i.e. both the circuit 2 and 5 are driving elements that receives power supply in order to drive OLED 1) (see Fig. 3, Col. 4, Lines 26-56),

selecting means (3) for selecting, one or more of the at least two drive elements in response to one or more select signals, and for providing said data signal (4) the selected one or more drive elements (i.e. the scan signal 3 selects both of the circuit 5 and 2 in response to the scan signal input) (see Fig 3, Col. 4, Lines 26-60),

wherein each drive element is adapted to drive the emissive element in a different drive current range in response to a given voltage of the analog data signal (i.e. the voltage value of 4) (i.e. the driving element respond to the data signal 4 and create the current that ultimately drives the OLED device 1) (see Fig. 2, Col. 3, Lines 25-63).

However Bu does not explicitly teach wherein when the analog data signal having a first voltage is provided to a first one of the drive elements and said first drive element is selected to drive the emissive element, a brightness of the emissive element is greater than when the analog data signal having the first voltage is provided to a second one of the drive elements and side second drive element is elected to drive the emissive element

Inukai teaches wherein when the analog data signal having a first voltage is provided to a first one of the drive elements and said first drive element is selected to drive the emissive element, a brightness of the emissive element is greater than when

the analog data signal having the first voltage is provided to a second one of the drive elements and side second drive element is elected to drive the emissive element (i.e. since the variation of the current inputs to both of the control unit forming the pixel circuitry has a dynamic altered in a frame by frame basis the application of the first element may result in a lower brightness than the application of the second element) (see Fig. 9-10, [0219-0222]).

Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to enhance the compensation OLED matrix pixel design of Bu with a pixel based dual gate control design of Inukai, where the feedback system is combined with the dual EL driving circuitry in order to implement a color multiple gray-scale EL display. (see Inukai [0035-0037])

As to claim 7, Bu and Inukai teaches a display device (i.e. OLED matrix display), comprising:

a plurality of pixel cells (i.e. the a matrix of OLED) (see Col. 3, Lines 1-24),

a current driven emissive element (OLED 1),

a data input for receiving an analog data signal (4),

at least two drive elements (circuit 5 and 2), each being connected to a power supply (i.e. power supply for the circuit) (see Fig. 2, Col. 3, Lines 16-23) and arranged to drive the emissive element in accordance with said analog data signal (i.e. the input voltage value of data signal 4 which control the adjustment of current for the OLED and therefore drives it) (see Fig. 3, Col. 4, Lines 26-56),

selecting means (3) for selecting, one or more of the at least two drive elements in response to one or more select signals, and for providing said data signal (4) the selected one or more drive elements (i.e. the driving element respond to the scan signal 3 and data signal 4 and create the current that ultimately drives the OLED device 1) (see Fig 3, Col. 4, Lines 26-60),

wherein each drive element is adapted to drive the emissive element in a different drive current range in response to a given voltage of the analog data signal (Vfb) (i.e. the input voltage signal 4 is being inputted and adjusted by the current comparator 6 which creates the Vfb feedback voltage value in place of the voltage input 4 to change the driving current range according to the adjustment) (see Fig. 2, Col. 3, Lines 25-63).and

a controller (i.e. the controller is the REF circuit composed of by P1 and P2 forming a current mirror) arranged to receive an analog video signal (i.e. voltage 4 which passes through circuit 2 and 5 and enters the current comparator 6), belonging to a first voltage range (i.e. voltage range for the data signal 4), to generate the analog data signal (Vfb) belonging to a second, more narrow voltage range (i.e. the more narrow voltage range is the adjusted range Vfb for feed back), and to associate said analog data signal (4) with a select signal indicating a desired drive current range (i.e. the feed back adjust the current range to one that is closer to the reference current range) (see Fig. 2, 3, Col. 3, Lines 1-64); and

means (i.e. the display panel having control lines that feed the necessary control signal such as scan signal 3 and current REF to the individual unit of the OLED pixel)

for providing said analog data signal (REF) and said select signal (Scan signal 3) to one of said pixel cells (i.e. one of the unite of OLED matrix circuit) (see Fig. 2, Col. 3, Lines 1-35);

Inukai teaches wherein when the analog data signal having a first voltage is provided to a first one of the drive elements and said first drive element is selected to drive the emissive element, a brightness of the emissive element is greater than when the analog data signal having the first voltage is provided to a second one of the drive elements and side second drive element is elected to drive the emissive element (i.e. since the variation of the current inputs to both of the control unit forming the pixel circuitry has a dynamic altered in a frame by frame basis the application of the first element may result in a lower brightness than the application of the second element) (see Fig. 9-10, [0219-0222]).

As to claim 9, Bu teaches a method for driving a pixel cell (OLED cell) comprising an emissive element (1 OLED) and at least two drive elements (circuit 5 and 6) for driving the emissive element, each drive element being adapted to drive the emissive element in a different drive current range in response to a given data signal (current REF) (i.e. the circuit 5 has driving current range while the circuit 6 provide adjusted current by mirroring a reference current) (see Fig. 2, Col. 3, Lines 1-64) said method comprising:

based on an analog video signal (4) belonging to a first voltage range (i.e. the driving current of the OLED is created from the original input which is a video signal

since the OLED matrix is active which constantly update the voltage creating a video display) (see Fig. 2, Col. 3, Lines 1-24), generating a data signal (Vfb) belonging to a second, more narrow voltage range (i.e. the reference current mirroring of circuit 5 creates a new voltage Vfb which is a more narrow voltage range as it is adjusted according to a set reference value) (see Fig. 2, Col. 3, Lines 1-35), and

associating said analog data signal (4) with one or more select signals indicating a desired drive current range (i.e. the reference comparator that compares the original voltage yielded current range with the Reference range REF), and, in response to the one or more select signal, providing said analog data signal (4) to a selected one or more of the drive elements in the pixel cell to drive the emissive element in the desired drive current range (i.e. the voltage adjustment Vfb value and the scan signal 3 are coordinated to create a properly adjusted current for the OLED 1 and therefore the both circuit 5 and 2 are both selected to create the proper current values) (see Fig. 2, Col. 3, Lines 1-64);

Inukai teaches wherein when the analog data signal having a first voltage is provided to a first one of the drive elements and said first drive element is selected to drive the emissive element, a brightness of the emissive element is greater than when the analog data signal having the first voltage is provided to a second one of the drive elements and side second drive element is elected to drive the emissive element (i.e. since the variation of the current inputs to both of the control unit forming the pixel circuitry has a dynamic altered in a frame by frame basis the application of the first

element may result in a lower brightness than the application of the second element) (see Fig. 9-10, [0219-0222]).

As to claim 2, Bu teaches a pixel cell according to claim 1, wherein said selecting means comprises at least two switches (i.e. switch 54 and 53), each arranged to be provided with a separate one of the select signals (i.e. the two switch as inverted input and therefore has separate input of the select signal 3), said select signals determining the drive current range resulting from a given data signal (4) (i.e. the two switch are necessary for the proper loading for the current feedback from 6 and thereby creating an adjusted current value for OLED 1) (see Fig. 2, Col. 3, Lines 1-64).

As to claim 3, Bu teaches a pixel cell according to claim 2, wherein, during a frame period (i.e. the frame period is the period in which the pixel is activated by the matrix), each switch is arranged to receive a select signal which is set either ON or OFF and in response (i.e. the scan signal 3 is a digital signal and there fore must by either ON or OFF) thereto, when the select signal is ON the switch causes a corresponding one of the drive elements to drive the emissive element, and when the select signal is OFF, the switch causes the corresponding drive element to not drive the emissive element (i.e. since both of the switch correspond to circuit 5 they activate the OLED according to the control of the scan signal) (see Fig. 2, Col. 3, Lines 1-64).

As to claim 4, Bu teaches a pixel cell according to claim 2, wherein during a frame period (i.e. the frame period is the period in which the pixel is activated by the matrix), each switch is arranged to receive a select signal which is alternatingly ON and OFF, and wherein said data signal (4) is enabled only during a portion of the frame period, and wherein when the select signal is ON the switch causes a corresponding one of the drive elements to drive the emissive element, and when the elect signal is OFF, the switch causes the corresponding drive element to not drive the emissive element (i.e. since in a active matrix the scanning is sequential for the entire display the scan signal must by intermittent for each of the pixel during a period of a frame, this means that the input data voltage signal 4 is only in an intermittent fashion and since both switch activate by the scan signal 3 they are affected by the ON and OFF state and drives the OLED 1 accordingly) (see Fig. 2, Col. 3, Lines 1-64).

As to claim 6, Bu teaches a pixel cell according to claim 1, where the current driven emissive element is an organic LED (OLED) (see Fig. 2, Col. 3, Lines 1-20).

As to claims 8 and 10 Bu teaches said first voltage range (i.e. the voltage range formed by input voltage 4) comprises voltages which are closer to threshold voltages of the pixel cell drive elements than any voltages in said second voltage range (i.e. since the input voltage first initializes the driving circuit 2 and 5 it is closer to the voltage exiting pixel driving element, and since the second range is the voltage feedback which is an adjust value according to the reference current the initial voltage is the closer

value) (see Fig. 2, Col. 3, Lines 24-64).

As to claim 11, Bu teaches a method according to claim 9, wherein said one or more select signals comprise at least two select signals each connected to a separate switch (i.e. the scanning signal 3 is inverted and thereby forming two opposite signals for the switch 54 and 53) (see Fig. 2).

As to claim 12, Bu teaches a method according to claim 9, wherein, during a frame period (i.e. the frame period is the period in which the pixel is activated by the matrix), each select signal is set either ON or OFF (i.e. since the control scan lines 3 must be either ON or OFF to set the lines as being selected or not selected) (see Fig. 2, Col. 3, Lines 1-24).

As to claim 13, Bu teaches a method according to claim 9, wherein, during a frame period (i.e. the frame period is the period in which the pixel is activated by the matrix), each select signal only is set ON during a portion of the frame period, and said data signal (4) only is enabled during a portion of the frame period (i.e. since in a active matrix display the scanning is sequential for the entire display the scan signal must by intermittent for each of the pixel during a period of a frame, this means that the input data voltage 4 signal is only inputted to the pixel according to the command of the scan signal 3 thereby changing the ON and OFF state and drives the OLED 1 accordingly)

(see Fig. 2, Col. 3, Lines 1-64).

As to claims 14 and 17, Bu teaches each drive element is directly connected to the power supply (i.e. the circuit 5 and 2 are directly connected to power supply via the voltage input 4 and Vfb which is formed by a power supply) (see Fig. 3).

As to claim 16 and 19, Bu teaches when the one or more select signals have a first state (i.e. the selecting scanning signal is OFF), the selecting means selects only a first one of the drive elements to drive the emissive element (i.e. since the switch 54 operates at the opposite polarity, part of the circuit 5 is selected and Vs is applied to the OLED 1), and when the one or more select signals have a second state (i.e. selecting scanning signal 3 is set to ON), the selecting means selects only a second one of the drive elements to drive the emissive element (i.e. when the scanning signal 3 is set to ON the element 2 is directed selected to drive OLED) (see Fig. 2-3, Col. 4, Lines 1-25).

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bu in view of Inukai as applied to claim 1 above, and further in view of Koyama USP. 6876350.

As to claim 5 Bu and Inukai does not explicitly teach where the drive elements comprise transistors having different transistor channel dimensions. Koyama teaches where the drive elements comprise transistors having different transistor channel

dimensions (i.e. the thin film transistor have different gate widths) (see Koyama, Col. 7, Lines 8-12).

Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to have used the different width TFT design of Koyama in the execution of the overall display system of Bu and Inukai in order to remove defect of lack of current uniformity (see Koyama, Col. 5, Lines 45-58)

***Response to Arguments***

5. Applicant's arguments with respect to claims 1-14, 16-17 and 19 have been considered but are moot in view of the new ground(s) of rejection see revised office action above.

***Inquiry***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Calvin Ma whose telephone number is (571) 270-1713. The examiner can normally be reached on Monday - Friday 7:30 - 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on (571) 272-7772. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Calvin Ma

March 30, 2009

/CHANH NGUYEN/
Supervisory Patent Examiner, Art Unit 2629